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**Anderson et al.**

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(54) **IRRIGATION SYSTEM**

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(58) **Field of Classification Search**

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(Continued)

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(56) **References Cited**

U.S. PATENT DOCUMENTS

3,181,273 A 5/1965 West et al.  
3,708,009 A 1/1973 Viol et al.  
(Continued)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

FOREIGN PATENT DOCUMENTS

JP 05146231 6/1993  
JP 07034696 B2 4/1995  
(Continued)

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OTHER PUBLICATIONS

PCT/US2013/045003 International Search Report and Written Opinion; Oct. 28, 2013; entire document.  
(Continued)

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(57) **ABSTRACT**

An irrigation system that includes a carriage may move along a predetermined path in a reciprocal manner. The carriage supports one or more exit ports that are fed plant growth material by a pressurized delivery arrangement. One or more plant stands are configured and arranged to straddle the carriage as it moves along the predetermined path. The one or more plant stands form a chamber into which plant roots may extend, and into which the one or more exit ports are able to discharge their plant growth material. The one or more plant stands may include side panels and a cap to reduce infiltration of light and contaminants, and to enhance

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